

Chapter 9: Treatment Plans

All specific treatment plans should incorporate, as initial steps, the appropriate common treatments discussed in chapter 7, with individual treatment plans then developed for each site (Plate 52). The treatment plans must be site-specific due to the complexity of each site, the often overlapping periods of construction and occupation, and the lack of a comprehensive interpretive plan. Site-specific treatment plans allow treatment to be phased and coordinated with other related sites.

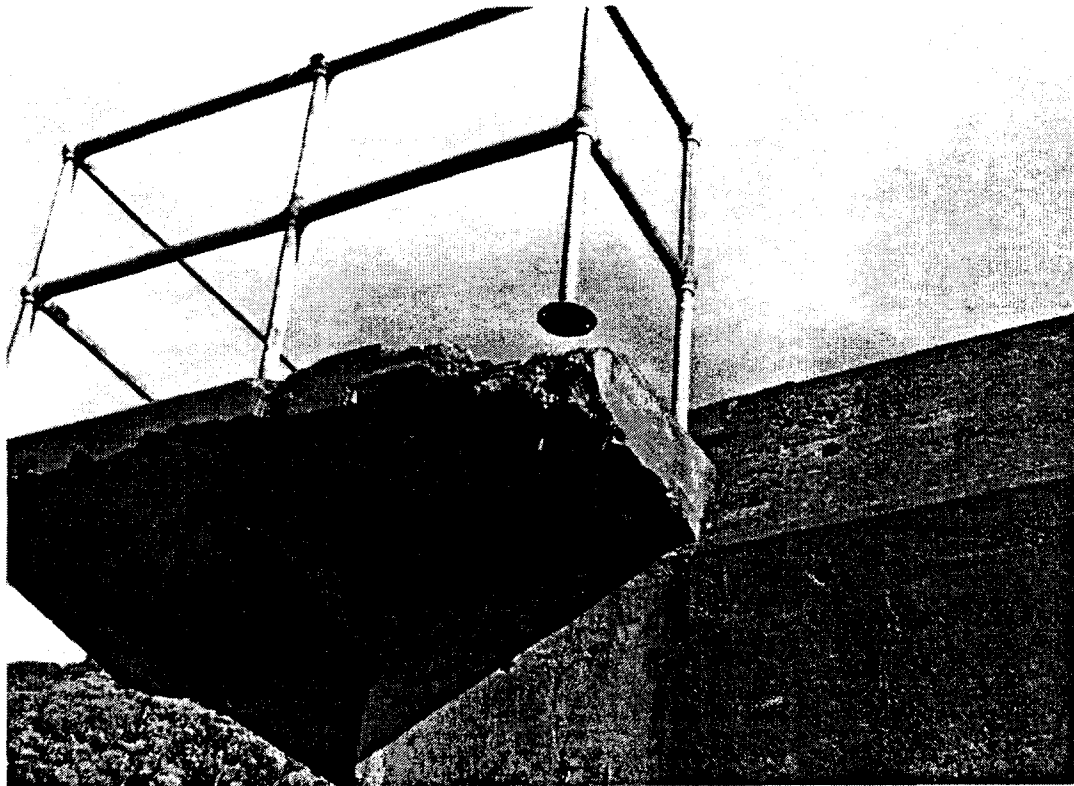


Plate 52. Major spalling and loss of concrete, underside of the battery commander's walk, Battery Kirby, Fort Baker, constructed 1899-1900. Battery commander's walk added after 1904.

From the site-specific treatment plans, similar elements can be identified and efficient treatment managed. For example, items such as concrete construction, wood and metal doors, waterproofing, handrails, and finish treatment issues can be coordinated throughout the system of fortifications insuring consistent and efficient treatment in detail. Specific treatment categories to be coordinated throughout the fortifications system include:

- Trail Development and Vegetation Control
- Concrete and Masonry Treatment
- Metals Treatment
- Waterproofing Treatment
- Paint and Coatings Treatment
- Graffiti Control and Removal
- Stenciled Signage
- Military Equipment and Fittings

Ventilation

Site-specific treatment plans should include three general categories of treatment: stabilization, preservation, and repair and restoration.

Stabilization

Sitework

1. Excavation: Limited excavation to improve surface drainage and to expose materials for investigation and testing.
2. Soil Stabilization: Temporary erosion barriers.
3. Earthwork: Limited earthwork to improve drainage and halt erosion.
4. Drainage: Clean all drainage paths including building gutters and downspouts, French drains, area drains, and surface drainage paths. Modify slopes to improve site drainage.
5. Landscaping and Vegetation Control: Removal of dead wood, selective removal of trees, clearance of brush, tree and brush thinning, and selective planting for soil stabilization.
6. Trails and Paving: Install new trails or pathways by installing compacted crushed stone paving materials. Modify slopes for visitor access and maintenance access.

Concrete

1. Cracks and Spalls: Install temporary fillers to prevent moisture infiltration into cracks and spalls. Install temporary patches to protect exposed rebar.
2. Structural Instability: Install temporary braces and shoring to hold unstable structural elements in place.

Masonry

1. Brickwork: Perform repairs to brickwork including temporary repointing with lime-sand mortar mix to secure bricks and prevent moisture infiltration. This patching mix is easily removed with no damage to the masonry. Install reinforcing in brick joints to bridge cracks and minimize separation. Reinforcing should be with one-fourth inch diameter galvanized threaded steel rods. Brace brick walls with temporary shoring if required.
2. Masonry Cleaning and Restoration: Remove mildew, efflorescence, or mild staining with a mix of water and bleach. Scrub with a soft bristle brush and rinse (one cup of bleach to one gallon of water.)

Metals

1. Structural Iron or Steel: Exposed structural iron and steel in the form of reinforcing steel and structural steel shapes should not be treated if more comprehensive treatment has been scheduled or if exposure threatens loss of material or structural integrity. If structural instability in the form of deflection is noted, bracing and shoring may be added to stabilize loading. Avoid attempting to reposition deflections. Temporary protection for severe exposure to moisture includes light brushing with a wire brush or steel wool, wiping metal with solvent, and the application of a temporary protective coating such as a rust-inhibiting primer.
2. Imbedded Metal Items: Wipe down with solvent.
3. Handrails: No stabilization required.

4. Miscellaneous Metals: For brass items, such as hinges, brush with a soft bristle brush to remove efflorescence and wipe with solvent.
5. Vegetation: Remove vegetation in contact with metal surfaces.

Carpentry

Wooden Materials: Provide temporary protection for exposed wood by cleaning away debris, rot, and any absorbent materials in contact with the wood. Remove any vegetation in contact with wood. With a dry brush, clean away any fungus, mold, or other surface growth. Brace sagging wood structures. Bleach in water may be used to remove mildew from wood surfaces.

Moisture Protection

1. Patch obvious leaks at cracks and joints using silicone sealants or lime-sand mortar mix (1:1 by volume) to minimize moisture infiltration.
2. Institute regular ventilation program.

Doors and Windows

1. Remove conditions that promote standing water adjacent to doors.
2. Install padlocks where existing hardware permits.
3. Brace doors that are warped or distorted.
4. Install painted plywood covers over existing windows to protect remaining historic fabric. Plywood should have holes drilled to allow for ventilation.

Finishes

Remove conditions that promote moisture such as encroaching vegetation or standing water.

Special Items

1. Secure or remove historic materials subject to vandalism or active deterioration to secure storage location.
2. Institute temporary ventilation program.

Preservation

Sitework

1. Excavation: As required for drainage improvement, investigation and testing, and for preservation of historic waterproofing materials.
2. Soil Stabilization: Installation of soil stabilization fabrics and barriers to preserve earthworks.
3. Earthwork: As needed to preserve berms and overhead earthen coverings including cut and fill work.
4. Drainage: Make historic drainage systems operable by cleaning out piping, drains, and drainage paths. Remove metal grates and apply protective coatings and patch inlets and piping. Clean and maintain integral drainage systems of structures.

5. Landscaping and Vegetation Control: Removal of dead wood, selective tree and brush removal, tree and brush thinning, and removal of all trees that have roots causing structural or moisture-related deterioration.
6. Trails and Paving: Install new trail materials, modify slopes for visitor and maintenance access, and coordinate trails between sites where possible. Augment with appropriate signage.

Concrete

1. Cracks and Spalls: Install permanent patches conforming to building lines and finishes to prevent moisture infiltration.
2. Structural Instability: Install permanent braces or shoring to hold concrete in a stable position. Where possible, realign concrete that has separated to original position and brace in place. Install visible permanent anchors or braces.

Masonry

1. Brickwork: Perform repairs to brickwork including permanent repointing with historic mortar mix, reverse deteriorated bricks, and reset bricks around cracks utilizing imbedded reinforcing ties.
2. Masonry Cleaning and Restoration: Remove mildew, efflorescence, and staining with bleach-water mix or approved chemical applications. Remove graffiti by approved means.

Metals

1. Structural Iron and Steel: Gritblast any exposed structural iron or steel, wipe with solvent, prime, and paint. Apply approved and tested migrating rust-inhibitors to concrete for protection of imbedded metal reinforcing. Install braces, shoring, or structural scabs to metals where required for structural integrity.
2. Imbedded Metal Items: Wipe with solvent and coat with microcrystalline wax or rust-conversion coating.
3. Handrails: Reset handrails in sleeves and regROUT. Clean metal by gritblasting, wipe with solvent, prime, and paint. Screw down all escutcheon plates.
4. Miscellaneous Metals: For brass items, brush to remove efflorescence, wipe with solvent, and provide protective wax coating.

Carpentry

Wooden Materials: Remove rotted wood and replace with treated lumber. Install wood bracing or missing elements sufficient for structural stability and moisture protection. Remove sources of moisture such as vegetation or standing water. Secure connections. Prime wood with anti-fungal primer and apply finish coats that contain anti-fungal components.

Moisture Protection

1. Where obvious leaks in waterproofing coatings are found, excavate any fill covering the material and repair using compatible materials. Patch any holes, penetration, or cracks allowing moisture infiltration.
2. Repair exposed roofs of concrete structures by application of appropriate, approved coatings.
3. Repair integral drains and gutters in concrete structures and make operable.

Doors and Windows

1. Wood Doors: Remove wood doors from hinges, provide temporary closure, and move doors to shop. Disassemble doors, replace rotted wood, gritblast metal frame and hardware, prime wood and metal and paint, and reassemble. Reinstall doors.
2. Ferrous Metal Doors: Remove metal doors, provide temporary closure, and move door to shop. Gritblast entire metal door and frame, wipe with solvent, prime, and paint. Reinstall door.
3. Hardware: Remove loose hardware and repair in shop. Repair fixed hardware in place. Clean hardware. If iron or steel, gritblast and apply appropriate finish. If non-ferrous metal, clean and wax. Reinstall.
4. Wood Windows: Remove window sash, repair frame in place, and repair sash in shop. Replace rotted or deteriorated stiles, rails, and muntins; prime; and reglaze. Reinstall window.
5. Ferrous Metal Windows: Clean metal frames and sash free of rust and loose paint. Replace missing elements and hardware. Prime, reglaze, and paint. Install sealants and make windows operable.

Finishes

1. Remove conditions that promote moisture deterioration such as vegetation and standing water.
2. Prepare surfaces, prime, and paint scheduled items including metals and wood. Do not remove remnants of historic concrete camouflage coatings or paint concrete surfaces.

Special Items

1. Preserve fixed items in place where possible. Reinstall items removed for security and shop repair.
2. Clean all fixed items.
3. Provide electrical service to each site and install basic lighting for interior spaces.
4. Institute regular ventilation program at each site utilizing restored or augmented ventilation systems or portable fans as needed to dissipate moisture.

Repair and Restoration

Sitework

1. Excavation: Perform excavation to expose and repair waterproofing surfaces, to repair or install drainage systems and underground utilities, and to restore original earthwork configurations.
2. Soil Stabilization: Perform soil stabilization measures as needed to stabilize soil around earthworks and foundations. Install erosion control fabrics, stable fill materials, and erosion control structures.
3. Earthwork: Restore earthworks by cutting, filling, and reconfiguring to achieve interpretive intentions.
4. Drainage: In addition to the restoration of existing drainage systems, perform drainage construction as needed to achieve site preservation and maintenance requirements.
5. Landscaping and Vegetation Control: In addition to tree removal and vegetation control, plant mixed native grasses for erosion control and to achieve period landscape character.
6. Trails and Paving: Install trails, paved areas, ramps, and steps for visitor access and safety. Restore original bituminous paving as a character-defining feature of the fortifications.

Concrete

Restore concrete by patching all spalls and cracks that admit or trap moisture, closing separations, and realigning shifted concrete. Perform epoxy injection to major structural cracks and separations. Install additional hidden reinforcement, jacks, dogs, and braces to maintain concrete stability. Reconstruct missing concrete elements.

Masonry

Fully restore brickwork by repointing all deteriorated joints, reversing damaged brick, patching brick, inserting reinforcement, and cleaning brick. Restore missing elements with replicated or salvaged matching brick. Remove graffiti in an approved manner.

Metals

1. Structural Iron and Steel: Restore exposed structural iron and steel by preparing surfaces, priming, and painting. Tighten all connections and fill voids. Construct and install replicated structural metal items such as frames, stairs, ladders, and other items.
2. Imbedded Metal Items: Restore imbedded metal items such as maneuvering rings by resetting and regrouting if required. Restore surfaces and apply protective wax coatings.
3. Handrails: Restore existing handrails and fabricate new handrails to match where original rails are missing or cannot be restored. These include, square section bars, chain rails and stanchions, and pipe rails and fittings.
4. Miscellaneous Metals: Clean metals and restore original finishes.

Carpentry

Wooden Materials: Restore all structural wood framing, trim, doors, windows, and other wood items.

Moisture Protection

1. Restore all waterproof coatings on vertical and overhead surfaces. Repair drainage courses, French drains, and replace missing clay drainage tile. Apply protective coatings to roofs and cast concrete drains.
2. Install sealants at cold joints, expansion joints, at window and door frames where moisture is admitted or trapped.
3. Roofing: Install new built-up roofs to replace original deteriorated or damaged roofs and ballast with matching local gravel.

Doors and Windows

1. Wood Doors: Restore all exterior wood slab doors in metal frames to a secure and weatherproof condition. Replace deteriorated wood to match original wood, prepare wood and metal surfaces, and paint.
2. Metal Doors: Restore all exterior metal sheet doors in metal frames to a secure and weatherproof condition. Replace or restore severely deteriorated metal, prepare surfaces and paint.
3. Hardware: Restore all hardware including latches, hasps, eyes, and other fittings, prepare surfaces and paint. Install padlocks.

4. Wood Windows: Restore all wood windows; replace missing or deteriorated parts or entire unit; reglaze, paint, and install sealants.

Finishes

1. Historic Concrete Coatings: Restore original paints and camouflage coatings on concrete matching original finishes. Remnants of original finishes may be damaged/destroyed if full restoration is selected. Document original finishes. Approximate original colors and textures. Where original mixes called for the use of oil on concrete, select a substitute binder and reconfigure mixture to avoid oil which is destructive to concrete.
2. Interior Finishes: Restore interior paintwork and whitewash finishes.
3. Ferrous Metal Coatings: Prepare surfaces by gritblasting, solvent wiping, and rust-conversion coating. Prime with zinc-rich or rust inhibiting primer, and paint with at least two coats of exterior enamel finish paint.
4. Wood Coatings: Prepare surfaces to bare wood or stable paint layer; prime with anti-fungal primer; and apply at least two coats of exterior enamel finish paint.
5. Graffiti Removal: Remove graffiti by approved means designed to cause minimal damage to substrate.
6. Signs and Stenciling: Protect existing historic signage and stencils. Restore by careful repainting or restenciling. Add new stenciling where supported by documentation.

Special Items

1. Mounted Equipment: Where possible and when available, purchase and install period or replicated equipment.
2. Military Hardware and Equipment: Where possible and when available, purchase and install military hardware and equipment including guns, optical instruments, communications equipment, furnishings, and other similar items.
3. Ventilation: Restore and make operational all mechanical and gravity/convection ventilation systems. Install new permanent mechanical or gravity/convection ventilation systems where interior spaces were not vented. Establish a regular ventilation program according to the quantity of air flow needed to dissipate accumulated moisture.
4. Electrical and Communications Equipment: Install underground electrical power to each site. Install disconnects, panels, wiring, conduit, switches, outlets, and fixtures as required for maintenance and approximating original lighting. Restore exposed fittings and fixtures.